C2

14. (Amended) A method according to claim 11 wherein said target analyte is a nucleic acid.

15. (Amended) A method according to claim 11 wherein said target analyte is a protein.

C3

19. (Amended) A method according to claim 11, wherein said analyzing comprises the use of a peak recognition scheme.

20. (Amended) A method according to claim 11, wherein said analyzing comprises a digital filter.

Please add new claims 28-50:

28. (New) The method of claim 11, wherein said electrode has an asymmetrical response to said input waveform.

29. (New) The method of claim 28, wherein said electron transfer moiety is degradable.

30. (New) The method of claim 29, wherein said electron transfer moiety is luminol.

31. (New) The method of claim 28, further comprising adding a co-reductant to said sample.

C4

32. (New) The method of claim 31, wherein said co-reductant is ferrocyanide.

33. (New) The method of claim 31, wherein said co-reductant has a lower redox potential than said electron transfer moiety.

34. (New) The method of claim 28, further comprising adding a co-oxidant to said sample.

35. (New) The method of claim 28, wherein said asymmetrical response is due to an enzyme-coupled reaction.

36. (New) The method of claim 11, wherein said input waveform is a voltage waveform and said output waveform is a current waveform, wherein said input waveform comprises an AC component having a first frequency and a first amplitude, and wherein said first amplitude is selected such that said output waveform comprises at least one non-linear harmonic component.

37. (New) The method of claim 11, wherein said harmonic component is chosen from the group consisting of the second, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth harmonic components.

38. (New) The method of claim 11, wherein said method comprises analyzing a plurality of harmonic components of said output waveform.

Sub D1

39. (New) The method of claim 11, wherein said input waveform comprises a square wave.

40. (New) The method of claim 39, wherein said harmonic component is an even harmonic component.

41. (New) The method of claim 11, further comprising computing a fast fourier transform of said detected output waveform.

42. (New) The method of claim 11, further comprising computing a joint time-frequency transform of said detected output waveform.

43. (New) The method of claim 11, wherein said input waveform comprises a plurality of components, each having a different frequency.

44. (New) The method of claim 11, further comprising fitting said harmonic component to a first curve and a second curve, wherein said first curve describes a Faradaic signal and said second curve describes a background signal.

45. (New) The method of claim 44, wherein said first curve is based, at least in part, on a modified Gaussian distribution.

46. (New) The method of claim 44, wherein said second curve is a fifth order polynomial.

47. (New) The method of claim 44, wherein said fitting comprises minimizing a mean square error.

48. (New) The method of claim 46, wherein said fitting said fifth order polynomial comprises using singular value decomposition.

49. (New) The method of claim 11, wherein said analyzing further comprises digital filtering.

50. (New) The method of claim 49, wherein said filtering utilizes a filter chosen from the group consisting of a match filter, a weiner filter, and a kalman filter.